

## ABSTRACT OF THE DISCLOSURE

The present invention describes a novel interaction between Smad6 and the Hox genes in nuclear transcriptional regulation following BMP signal transduction. The present invention further provides methods of using this novel Smad6/Hox protein interaction to regulate gene expression, regulate bone formation and control osteoporosis. Further provided are methods of screening for compounds that interfere with the novel Smad6/Hox protein interaction, thereby resulting in expression of a Hox protein-repressed gene and/or stimulating bone formation.